POSE-INVARIANT FACE RECOGNITION SYSTEM AND PROCESS

ABSTRACT OF THE DISCLOSURE

A face recognition system and process for identifying a person depicted in an input image and their face pose. This system and process entails locating and extracting face regions belonging to known people from a set of model images, and determining the face pose for each of the face regions extracted. All the extracted face regions are preprocessed by normalizing, cropping, categorizing and finally abstracting them. More specifically, the images are normalized and cropped to show only a persons face, categorized according to the face pose of the depicted person's face by assigning them to one of a series of face pose ranges, and abstracted preferably via an eigenface approach. The preprocessed face images are preferably used to train a neural network ensemble having a first stage made up of a bank of face recognition neural networks each of which is dedicated to a particular pose range, and a second stage constituting a single fusing neural network that is used to combine the outputs from each of the first stage neural networks. Once trained, the input of a face region which has been extracted from an input image and preprocessed (i.e., normalized, cropped and abstracted) will cause just one of the output units of the fusing portion of the neural network ensemble to become active. The active output unit indicates either the identify of the person whose face was extracted from the input image and the associated face pose, or that the identity of the person is unknown to the system.